FINAL REPORT August 2006

REPORT NO. 06-19



FIRST ARTICLE TESTS FOR THE 40"x 48" RECYCLED PLASTIC PALLET WITH CARTRIDGE, 20MM WITH 24 M548 METAL BOXES, MANUFACTURED BY ROTATIONAL MOLDING FROM BRIGHAM CITY, UTAH, IN ACCORDANCE WITH MIL-STD-1660,

"DESIGN CRITERIA FOR AMMUNITION UNIT LOADS"

Prepared for:

Distribution Unlimited

Program Manager-506th Combat Sustainment Squadron (CBSS) 6033 Elm Lane Hill AFB, UT 84056



DEFENSE AMMUNITION CENTER VALIDATION ENGINEERING DIVISION MCALESTER, OKLAHOMA 74501-9053

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REPORT NO. 06-19

FIRST ARTICLE TESTING FOR 40"x48" RECYCLED

PLASTIC PALLET WITH CARTRIDGES, 20MM WITH 24 M548

METAL BOXES, MANUFACTURED BY ROTATIONAL MOLDING FROM

BRIGHAM CITY, UTAH, IN ACCORDANCE WITH MIL-STD-1660,

"DESIGN CRITERIA FOR AMMUNITION UNIT LOADS"

ABSTRACT

The U.S. Army Defense Ammunition Center (DAC), Validation Engineering Division (SJMAC-DEV) conducted First Article Tests for the 40"x48" Recycled Plastic Pallets with Cartridges, 20MM with 24 M548 metal boxes, manufactured by Rotational Molding from Brigham City, Utah, in accordance with MIL-STD-1660, "Design Criteria for Ammunition Unit Loads". Three test units were tested with a load of 4,030 lbs each. The tests that were to be accomplished on the test units were the stacking, repetitive shock, drop, incline impact, forklift handling, and disassembly tests.

Test Units #1 and #2 were tested in accordance with MIL-STD-1660 at ambient temperature, both test units failed during the first orientation of the repetitive shock test. The recycled plastic material could not withstand the heat generated by the friction created during the repetitive shock tests. The pallet posts were weakened from the heat and collapsed under the weight of the test load. Also, plastic deformation of the skids occurred as a result of the repetitive impacting of the skids to the vibration table. Test Unit #3 was drop tested, incline impacted, forklift hazard course tested, and disassembled for engineering evaluation purposes only. Test Unit #3 minimally passed the evaluation testing which excluded the stacking and repetitive shock tests. The pallet posts showed signs of failure from the weight of the test load. It should also be noted that the current pallet design is not a winged pallet.

The current design of the 40" x 48" Recycled Plastic Pallet manufactured by Rotational Molding from Brigham City, Utah, does not meet the requirements of MIL-STD-1660, and is not recommended for the unitization of ammunition loads.

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FIRST ARTICLE TESTING FOR 40"x48" RECYCLED
PLASTIC PALLET WITH CARTRIDGES, 20MM WITH 24 M548
METAL BOXES, MANUFACTURED BY ROTATIONAL MOLDING FROM
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PART 1 - INTRODUCTION

- A. <u>BACKGROUND</u>. The U.S. Army Defense Ammunition Center (DAC), Validation Engineering Division (SJMAC-DEV) conducted First Article Tests for the 40"x48" Recycled Plastic Pallets with cartridges, 20MM with 24 M548 metal boxes, Manufactured by Rotational Molding from Brigham City, Utah, in accordance with MIL-STD-1660, "Design Criteria for Ammunition Unit Loads". Three test units were tested with a load of 4,030 lbs each. The tests that were to be accomplished on the test units were the stacking, repetitive shock, drop, incline impact, forklift handling, and disassembly tests. The unitization procedures were provided by DAC, Transportation Engineering Division (SJMAC-DET).
- **B.** <u>AUTHORITY</u>. This test was conducted IAW mission responsibilities delegated by the U.S. Army Joint Munitions Command (JMC), Rock Island, IL. Reference is made to the following:
 - 1. AR 740-1, 15 June 2001, Storage and Supply Activity Operation
- 2. OSC-R, 10-23, Mission and Major Functions of U.S. Army Defense Ammunition Center (DAC) 21 Nov 2000.
- C. <u>OBJECTIVE</u>. The objective of the tests was to determine if the Recycled Plastic Pallet could meet the MIL-STD-1660 test requirements prior to the acceptance of the unitization procedures by the U.S. Army.
- D. <u>CONCLUSION</u>. Test Units #1 and #2 were tested in accordance with MIL-STD-1660 at ambient temperature, both test units failed during the first orientation of the repetitive shock test. The recycled plastic material could not withstand the heat generated by the friction created during the repetitive shock tests. The pallet posts were weakened from the heat and collapsed under the weight of the test load. Also, plastic deformation of the skids occurred as a result

of the repetitive impacting of the skids to the vibration table. Test Unit #3 was drop tested, incline impacted, forklift hazard course tested, and disassembled for engineering evaluation purposes only. Test Unit #3 minimally passed the evaluation testing which excluded the stacking and repetitive shock tests. The pallet posts showed signs of failure from the weight of the test load. It should also be noted that the current pallet design is not a winged pallet.

The current design of the 40" x 48" Recycled Plastic Pallet manufactured by Rotational Molding from Brigham City, Utah, does not meet the requirements of Mil-Std-1660, and is not recommended for the unitization of ammunition loads.

PART 2 - ATTENDEES

DATE PERFORMED: Test Unit #1- June 21, 2006

Test Unit #2- June 21-22, 2006

Test Unit #3- June 22, 2006

ATTENDEE MAILING ADDRESS

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PART 3 - TEST PROCEDURES

1. MIL-STD-1660 TEST.

The test procedures outlined in this section from were extracted from the MIL-STD-1660. The tests are conducted on ammunition pallet units or unit loads and are summarized as follows:

A. <u>STACKING TEST</u>. The test unit will be tested to simulate a stack of identical items stacked 16 feet high, for a period of one hour. This stacking load will be simulated by subjecting the specimen to a compression weight equal to an equivalent 16-foot stacking height. Photo 1 below shows an example of a unit load in the compression tester.



Photo 1. Example of Stacking Test.(2.75-inch Hydra 70, PA151 Rocket Pallet in the Stacking Test.)

B. <u>REPETITIVE SHOCK TEST</u>. The repetitive shock test is conducted IAW Method 5019, Federal Standard 101. The test procedure is as follows: The test unit will be placed on (not fastened to) the platform. With the test unit in one

position, the platform will be vibrated at ½-inch amplitude (1-inch double amplitude) starting at a frequency of approximately 3 cycles-persecond. The frequency will be steadily increased until the specimen leaves the platform. The resonant frequency is achieved when a 1/16-inch-thick feeler gage momentarily slides freely between every point on the specimen in contact with the platform at some instance during the cycle. Midway into the testing period, the specimen will be rotated 90 degrees, and the test continued for the duration. Unless failure occurs, the total time of vibration will be three hours. Photo 2 shows an example of the repetitive shock test.

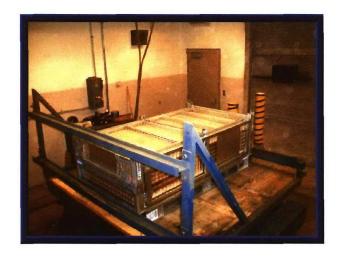


Photo 2. Example of the Repetitive Shock Test.

(MSTF Low)

C. <u>EDGEWISE-ROTATIONAL DROP TEST</u>. This test is conducted using the procedures of Method 5008, Federal Standard 101. The procedure for the edgewise-rotational drop test is as follows: The test unit will be placed on its skids with one end of the pallet supported on a beam 6 inches high. The height of the beam will be increased as necessary to ensure that there is no support for the skids between the ends of the specimen when the dropping takes place, but should not be high enough to cause the specimen to slide on the supports when the dropped end is raised for the drop. The unsupported end of the specimen is

then raised and allowed to fall freely to the concrete, pavement, or similar unyielding surface from a prescribed height. Unless otherwise specified, the height of drop for level A protection will conform to the following tabulation:

GROSS WEIGHT (WITHIN RANGE LIMITS)	DIMENSIONS OF ANY EDGE, HEIGHT OR WIDTH (WITHIN RANGE LIMITS)	ON E	OF DROPS DGES
(Pounds)	(Inches)	Level A	Level B
(i odilds)	(inches)	(Inches)	(Inches)
150-250	60-66	36	27
250-400	66-72	32	24
400-600	72-80	28	21
600-1,000	80-95	24	18
1,000-1,500	95-114	20	16
1,500-2,000	114-144	17	14
2,000-3,000	Above 145- No limited	15	12
Above – 3,000		12	9

Figure 1.



Photo 3. Example of Edgewise-Rotational Drop Test (MSTF Low)

D. INCLINE-IMPACT TEST. This test is conducted by using the procedure of Method 5023, Incline-Impact Test of Federal Standard 101. The procedure for the incline-impact test is as follows: The test unit will be placed on the carriage with the surface or edge to be impacted projecting at least 2 inches beyond the front end of the carriage. The carriage will be brought to a predetermined position on the incline and released. If it were desired to concentrate the impact on any particular position on the container, a 4- x 4-inch timber may be attached to the bumper in the desired position before the test. The carriage will not strike any part of the timber. The position of the specimen on the carriage and the sequence in which surfaces and edges are subjected to impacts may be at the option of the testing activity and dependent upon the objective of the test. When the test is to determine satisfactory requirements for a container or pack, and, unless otherwise specified, the specimen will be subjected to one impact on each surface that has each dimension less than 9.5 feet. Unless otherwise specified, the velocity at the time of the impact will be 7 feet-per-second. Photo 4 shows an example of this test.



Photo 4. Example of the Incline-Impact Test. (2.75-Inch, Hydra 70, PA151 Rocket Pallet on incline-impact tester.)

- E. <u>SLING COMPATIBILITY TEST</u>. The test unit utilizing special design or non-standard pallets will be lifted, swung, lowered and otherwise handled as necessary, using slings of the types normally used for handling the unit loads under consideration. Slings will be easily attached and removed. Danger of slippage or disengagement when load is suspended will be cause for rejection of the specimen.
- F. FORKLIFTING TESTS. The test unit will be lifted clear of the ground by a forklift from the end of the test unit and transported on the forks in the level or back-tilt position. The forklift will pass over the Optional Rough Handling Course For Forklift Trucks as outlined in MIL-STD-1660. The course will consist of parallel pairs of 1-inch boards spaced 54 inches apart and will be laid flat wise on the pavement across the path of the forklift. One pair will be laid at an angle of approximately 60 degrees to the path so that the left wheel strikes first. Another pair will be laid securely across the path of the forklift so that the wheels strike simultaneously. Another pair will be laid at an angle of approximately 75 degrees to the path so that the right wheel strikes first. The test unit will be transported over the Optional Rough Handling Course. The test unit shall be observed for deflection and damage. The test unit will be rotated 90 degrees and the test unit lifted from the side and the above steps repeated.
- **G. DISASSEMBLY TEST.** Following all rough handling tests the test unit may be squared up within 2 inches of its original shape and on a flat level surface. The strapping will then be cut and removed from the palletized load. Assembly of the test unit will be such that it retains its unity upon removal of the strapping.

PART 4 - TEST EQUIPMENT

A. COMPRESSION TESTER.

1. Manufacturer: Ormond Manufacturing

2. Platform: 60- x 60-inches

3. Compression Limit: 50,000 pounds

4. Tension Limit: 50,000 pounds

B. TRANSPORTATION SIMULATOR.

1. Manufacturer: Gaynes Laboratory

2. Capacity: 6,000-pound payload

3. Displacement: 1/2-inch amplitude

4. Speed: 50 to 400 RPM

5. Platform: 5- x 8-foot

C. INCLINED PLANE.

1. Manufacturer: Conbur Incline

2. Type: Impact Tester

3. Grade: 10 percent incline

4. Length: 12-foot

PART 5 - TEST RESULTS

5.1. <u>TEST UNIT DATA</u>. The test units were inertly loaded to the specified design weight using inert materials. The test unite were prepared using the unitization procedures specified in Part 6 – Drawings. Special care was taken to ensure that each M548 Metal Box had the proper amount of weight in order to achieve a realistic pallet center of gravity (CG). Once properly prepared, Test Units #1 and #2 were tested using MIL-STD-1660 requirements. Test Unit #3 was tested to MIL-STD-1660 testing excluding stacking and repetitive shock tests for engineering evaluation purposes only.

TEST UNIT #1

40" x 48" Recycled Plastic Pallet with 24 each M548 metal boxes ILoaded with 160 lbs each of inert material

Test Date:

21 June 2006 (MIL-STD-1660)

Gross Weight:

4,030 pounds

Length:

49 3/4 inches

Width:

40 1/4 inches

Height:

35 inches

Mfgr:

Rotational Molding of Utah

TEST UNIT #2

40" x 48" Recycled Plastic Pallet with 24 each M548 metal boxes loaded with 160 lbs each of inert material

Test Date:

21-22 June 2006 (MIL-STD-1660)

Gross Weight:

4,030 pounds

Length:

49 3/4 inches

Width:

40 1/4 inches

Height:

35 inches

Mfgr:

Rotational Molding of Utah

TEST UNIT #3

40" x 48" Recycled Plastic Pallet with 24 each M548 metal boxes loaded with 160 lbs each of inert material

Test Date: 22 June 2006 (MIL-STD-1660)

Gross Weight: 4,030 pounds

Length: 49 3/4 inches

Width: 40 1/4 inches

Height: 35 inches

Mfgr: Rotational Molding of Utah

A. MIL-STD-1660 TEST RESULTS TEST UNIT #1:

1. <u>STACKING TEST</u>. The test unit was compressed with a load force of 16,120 pounds for 60 minutes on 21 June 2006. No damage was noted as a result of this test. Photo 5 shows the test unit in the compression unit.



Photo 5. Test Unit in the Stacking Test.

2. REPETITIVE SHOCK TEST. Test Unit #1 was vibrated 90 minutes at 228 RPM in the longitudinal orientation on 21 June 2006. Test Unit #1 failed during the first orientation of the repetitive shock test. The recycled plastic material could not withstand the heat generated by the friction created during the repetitive shock tests. The pallet posts and bottom adapters were weakened from the heat and collapsed under the weight of the test load, see Photo 6. Also, plastic deformation of the skids occurred as a result of the repetitive impacting of the skids to the vibration table, see Photo 7. Photo 8 shows the test unit on the vibration platform. Test Unit #1 failed and testing was stopped on this test unit.



Photo 6. Collapse of Pallet During Repetitive Shock Testing.



Photo 7. Melted Skid During Repetitive Shock Testing.



Photo 8. Test Setup for Repetitive Shock Testing.

- 3. EDGEWISE ROTATIONAL DROP TEST. N/A
- 4. INCLINE-IMPACT TEST. N/A

- 5. **SLING COMPATIBILITY TEST**. N/A.
- 6. FORKLIFTING TEST. N/A.
- 7. <u>DISASSEMBLY TEST</u>. See Photos 9 and 10 for additional damage discovered during disassembly.

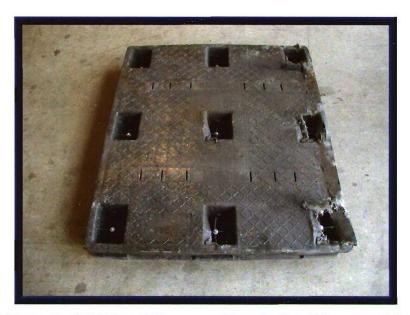


Photo 9. Additional Damage Noted after Disassembly.



Photo 10. Additional Damage Noted after Disassembly.

8. <u>CONCLUSION</u>. Test Unit #1 failed and testing was stopped on this test unit during the first orientation of the repetitive shock testing.

B. MIL-STD-1660 TEST RESULTS TEST UNIT#2:

- STACKING TEST. The test unit was compressed with a load force of 16,120 pounds for 60 minutes on 21 June 2006. No damage was noted as a result of this test.
- 2. REPETITIVE SHOCK TEST. The test unit was vibrated 90 minutes at 228 RPM in the longitudinal orientation on 22 June 2006. Test Unit #2 failed during the first orientation of the repetitive shock test. The damage noted was identical to the damage sustained to test unit #1 during the repetitive shock testing.
 - 3. EDGEWISE-ROTATIONAL DROP TEST. N/A.
 - 4. INCLINE-IMPACT TEST. N/A.
 - 5. SLING COMPATIBILITY TEST. N/A.
 - 6. FORKLIFTING TEST. N/A.
- 7. <u>DISASSEMBLY TEST</u>. Damage was identical to damage sustained during testing of Test Unit #1.
- 8. <u>CONCLUSION</u>. Test Unit #2 failed and testing was discontinued on this test unit during the first orientation of the repetitive shock testing. The current design of the 40" x 48" Recycled Plastic Pallet manufactured by Rotational

Molding from Brigham City, Utah, does not meet the requirements of Mil-Std-1660, and is not recommended for the unitization of ammunition loads.

C. MIL-STD-1660 TEST RESULTS TEST UNIT#3:

Note – Test Unit #3 was drop tested, incline impacted and taken over the forklift hazard course for engineering evaluation purposes only. The recycled plastic pallet had already failed the MIL-STD-1660 First Article Test.

- 1. STACKING TEST. N/A.
- 2. REPETITIVE SHOCK TEST. N/A.
- 3. <u>EDGEWISE-ROTATIONAL DROP TEST</u>. The test unit was edgewise rotationally dropped from a height of 12 inches on both longitudinal sides and both lateral sides. The pallet posts showed signs of failure from the impact of the drops. See photo11 for test setup.



Photo 11. Test Setup for Edgewise Drop Tests.

4. <u>INCLINE-IMPACT TEST</u>. The test unit was impact tested on both longitudinal sides and both lateral sides. No significant damage was noted as a result of this test. See Photo 12 for test setup.



Photo 12. Test Setup for Incline Impact Tests.

5. SLING COMPATIBILITY TEST. N/A.

- 6. <u>FORKLIFTING TEST</u>. The test unit was lifted clear of the ground by a forklift from both longitudinal sides and both lateral sides and transported on the Optional Rough Handling Course For Forklift Trucks. The test unit was carried over the course three times in the longitudinal and lateral orientations. No damage was noted as a result of this test.
 - 7. **DISASSEMBLY TEST**. Inspection revealed no additional damage.
- **8.** <u>CONCLUSION.</u> Test Unit #3 showed signs of failure in the pallet posts during the drop tests from the weight of the pallet. No further damage was noted during the incline impact or forklift hazard course tests.

PART 6- DRAWINGS

The following test sketches represent the load configuration that was subjected to the test criteria.

APPENDIX 15C

UNITIZATION PROCEDURES FOR BOXED AMMUNITION AND COMPONENTS ON 4-WAY ENTRY PALLETS

CARTRIDGE, 20MM, PACKED VARIOUS QUANTITIES
PER M548 METAL BOX, UNITIZED 24 BOXES PER
40" X 48" PALLET; APPROX BOX SIZE 18-19/32" L
X 8-19/64" W X 14-19/32" H

NOTICE: THIS APPENDIX CANNOT STAND ALONE BUT MUST BE USED IN CONJUNCTION WITH THE BASIC UNITIZATION PROCEDURES DRAWING 19-48-4116-20PA1002.

THIS APPENDIX SUPERSEDES THE TWO-LAYER UNITIZATION PROCEDURES OF INTERIM DRAWING 19-48-4141-20PA1003, DATED FEBRUARY 1977.

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	PALLET UNIT DATA											
ITEMS INCL	JOEO	HAZARO AND DIV	APPROX									
иги	DODIC	OD CLASS	COMP GROUP	WEIGHT LBS								
1305- 00-522-3700 00-785-2829 01-118-9930 00-935-6171 01-118-9929 00-926-9278 00-143-7050 00-143-7176 00-143-7176 00-143-7167 00-143-7168 00-935-9104 01-116-3931 01-118-9928 00-752-8114 01-116-4560 00-935-2019 01-116-3930 00-799-8669 01-116-3923	A651 A651 A659 A791 A814 A834 A834 A835 A846 A890 A890 A891 A891 A8924 A924	1.4 1.4 (04)1.2 (04)1.2 (04)1.2 (04)1.2 (04)1.2 (04)1.2 (04)1.2 (04)1.2 (04)1.2 (04)1.2 (1.4 1.4 1.4 1.4		3,647 3,647 4,000 * 3,983 4,000 * 3,983 2,782 2,782 2,782 2,782 2,782 2,782 2,782 2,782 2,782 2,782 4,000 * 4,000 * 3,599 4,000 * 3,599 4,000 * 3,983 4,000 * 3,983 4,000 * 3,983 4,000 *								

HAZARO CLASSIFICATION DATA CONTAINED IN THE ABOVE CHART IS FOR GUIDANCE AND INFORMATIONAL PURPOSES ONLY. VERIFICATION OF THE SPECIFIED DATA SHOULD BE MADE BY CONSULTING THE MOST RECENT JOINT HAZARO CLASSIFICATION SYSTEM LISTING OR OTHER APPROVED LISTING(S).

* SEE GENERAL NOTE "K" ON PAGE 3.

REVISIONS

REVISION NO. 1, DATED NOVEMBER 1981, CONSISTS OF:

- ADDING NATIONAL STOCK NUMBER TO THE "PALLET UNIT DATA" CHART.
- 2. REDESIGNING "FILLER ASSEMBLY".

REVISION NO. 2, DATED NOVEMBER 1982, CONSISTS OF:

1 ADDING JUT "J" TO GENERAL NOTES SECTION ON PAGE 3.

REVISION NO. 3. DATED DECEMBER 1983, CONSISTS OF:

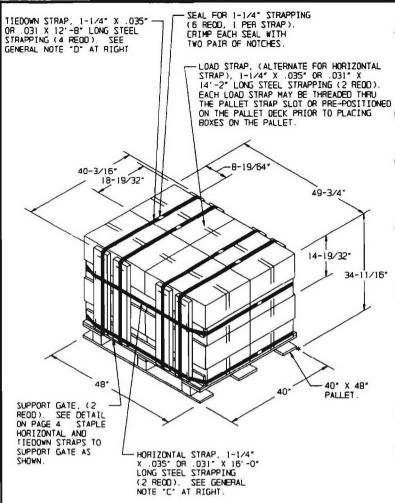
1. CHANGING BOX DIMENSIONS.

REVISION NO. 4, DATED AUGUST 1994, CONSISTS OF:

- 1 CHANGING WEIGHT OF NATIONAL STOCK NUMBERS ON THE "PALLET UNIT DATA" CHART.
- ADDING NATIONAL STOCK NUMBER TO "PALLET UNIT DATA" CHART.

REVISION NO. 5. DATED SEPTEMBER 1996, CONSISTS OF:

- 1. CHANGING THE LOAD STRAP CALLOUT ON PAGE 3.
- DELETING GENERAL NOTE RELATING TO STRAP CUTTER AND RE-LETTERING OTHER GENERAL NOTES.



PALLET UNIT

SEE GENERAL NOTE "B" AT RIGHT.

																													(APPROX)
DUNNAGE	Ε.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	63	LB2		
PALLET		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	=	-	-	80	LB2		

														- 3,983 LBS (APPROX)
CUBE	 -	-	 -	-	-	-	-	-	-	-	-	-	-	40.2 CU FT (APPROX)

	BILL OF MATERIA	AL						
LUMBER	LINEAR FEET	BOARO FEET						
1" X 4" 2" X 5"	16.58 19.33	5.53 19.33						
NAILS	NO. REOD	POUNDS						
6d(2*)	48	0.28						
	" 1 REOX 3/4" - 82.67' REOX RAPPING 6 REOX	0 12.53 LBS 0 NIL						

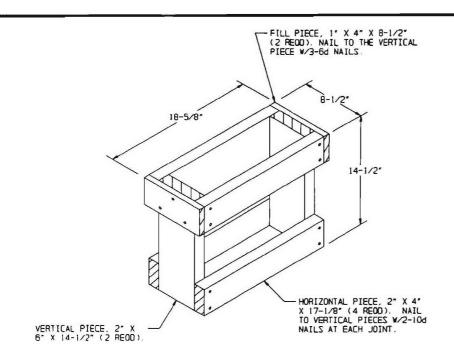
GENERAL NOTES

- A. THIS APPENDIX CANNOT STAND ALONE BUT MUST BE USED IN CONJUNCTION WITH THE BASIC UNITIZATION PROCEDURES DRAWING 19—48—4116—20PA1002. TO PRODUCE AN APPROVED UNIT LOAD, ALL PERTINENT PROCEDURES, SPECIFICATIONS AND CRITERIA SET FORTH WITHIN THE BASIC DRAWING WILL APPLY TO THE PROCEDURES DELINEATED IN THIS APPENDIX. ANY EXCEPTIONS TO THE BASIC PROCEDURES ARE SPECIFIED IN THIS APPENDIX.
- B. DIMENSIONS, CUBE AND WEIGHT OF A PALLET UNIT WILL WARY SLIGHTLY DEPENDING UPON THE ACTUAL DIMENSIONS OF THE BOXES AND THE WEIGHT OF THE SPECIFIC ITEM BEING UNITIZED.
- C. INSTALL EACH HORIZONTAL STRAP TO ENCIRCLE A LAYER OF BOXES ON THE PALLET. NOTE THAT THE STRAPS WILL BE LOCATED AS SHOWN, ALIGNED WITH THE HORIZONTAL PIECE OF THE "SUPPORT GATE". HORIZONTAL STRAPS MUST BE TENSIONED AND SEALED PRIOR TO THE APPLICATION OF TIEDOWN STRAPS.
- D. INSTALL EACH TIEDOWN STRAP TO PASS UNDER THE TOP DECK BOARDS OF THE PALLET AND TO BE LOCATED AS SHOWN, ALIGNED WITH THE VERTICAL PIECES OF THE "SUPPORT GATE". TIEDOWN STRAPS WILL NOT BE APPLIED UNTIL THE HORIZONTAL STRAPS HAVE BEEN TENSIONED AND SFALED.
- E. THE FOLLOWING AMC DRAWINGS ARE APPLICABLE FOR OUTLOADING AND STORAGE OF THE ITEMS COVERED BY THIS APPENDIX

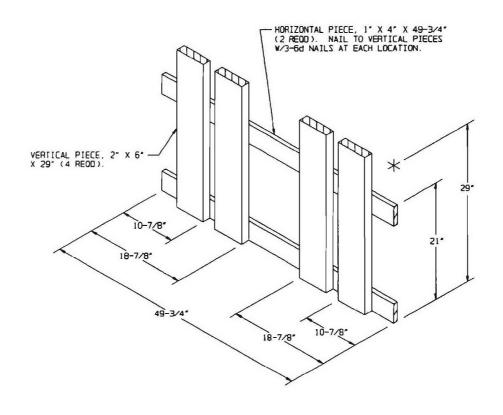
CARLOADING - - - 19-48-4115-5PA1002
TRUCKLOADING - - 19-48-4117-11PA1003
STORAGE - - - 19-48-4118-1-2-3-4-14-22PA1002
END OPENING ISO
CONTAINER - - - 19-48-4153-15PA1002
MILVAN - - - - 19-48-4166-15PA1003
SIDE OPENING ISO
CONTAINER - - - 19-48-4267-15PA1009

- F. IF ITEMS COVERED HEREIN ARE UNITIZED PRIOR TO ISSUANCE OF THIS APPENDIX, THE BOXES NEED NOT BE REUNITIZED SOLELY TO CONFORM TO THIS APPENDIX.
- G. THE UNITIZATION PROCEDURES DEPICTED HEREIN MAY ALSO BE USED FOR UNITIZING ZOMM CARTRIDGES WHEN IDENTIFIED BY DIFFERENT NATIONAL STOCK NUMBERS (NSN) THAN WHAT IS SHOWN ON PAGE 2, PROVIDED THE BOX PACK DOES NOT VARY FROM WHAT IS DELINEATED HEREIN. THE EXPLOSIVE CLASSIFICATION OF OTHER ITEMS MAY BE DIFFERENT THAN WHAT IS SHOWN.
- H. THE STYLE I PALLET DELINEATED IN THE DETAIL AT LEFT NEED NOT HAVE CHAMFERS OR STRAP SLOTS AS SPECIFIED WITHIN MILITARY SPECIFICATION MIL-P-15011 WHEN USED FOR THE UNITIZATION OF ITEMS COVERED BY THIS APPENDIX.
- J. ALL DUNNAGE SHALL BE PRESERVATIVE TREATED IN ACCORDANCE WITH GENERAL NOTE "X" IN THE BASIC
- K. REGARDLESS OF THE DUANTITY OF BOXES TO BE PALLETIZED, THE TOTAL MEIGHT OF A FULLY LOADED PALLET UNIT WILL NOT EXCEED 4,000 POUNDS. WHEN THE YOTAL WEIGHT OF A FULLY LOADED PALLET UNIT EXCEEDS 4,000 POUNDS, ONE OR MORE LOADED BOXES MUST BE REMOVED, AND EITHER FILLER ASSEMBLIES, AS DEPICTED ON PAGE 4, OR EMPTY BOXES MUST BE SUBSTITUTED THEREFORE. FOR ADDITIONAL GUIDANCE, SEE THE "PROVISIONS FOR LESS-THAN-FULL-LAYER LOADS" IN THE BASIC UNITIZATION PROCEDURES DRAWING 19-48-4116-20PA1002.

PAGE 3



(FOR MINUS ONE BOX)



SUPPORT GATE

PAGE 4